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TECHNOLOGY DEPT.

# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 14, 1944



Cameras In the Surgery

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A SCIENCE SERVICE PUBLICATION



## A WELCOME HAND TO BELL SYSTEM WAR VETERANS

Some day we shall have the pleasure of welcoming back to the Bell System the men and women who are now in the armed forces. They number more than 55,000. Some 3500 released from service are already back with us.

We shall have a warm welcome for the rest as they join us again. Not only shall we be glad to see them personally but we shall be glad of their skill and energy for the big tasks which face the Bell System in the future.

**BELL TELEPHONE SYSTEM**



## PHYSICS

# 2,000,000-Volt X-Rays

Pictures through extremely thick sections of steel are now possible with these new tubes. 1,000,000-volt tube has been most powerful up to now.

► X-RAY pictures through extremely thick sections of steel are now possible with new 2,000,000-volt X-ray tubes, recently perfected by two firms, independent of each other. One of these high-voltage precision tubes has been developed by Machlett Laboratories, Inc., Springdale, Conn. The other was described by Dr. Ernest E. Charlton and Willem F. Westendorp, of the Research Laboratory, General Electric Company, Schenectady, N. Y., to the National Electronics Conference in Chicago.

Up to now the most powerful X-ray unit in general use has been a million-volt tube developed for the examination of metal sections. High voltage tubes are also used as an effective tool in cancer research. Both new tubes greatly reduce the exposure time required to make radiographs of metal sections.

The new 2,000,000-volt Machlett tube represents a new development in the previous art of high-voltage tube-making. It is completely sealed-off, like an ordinary radio tube or an electric light bulb, so the high vacuum within it does not have to be maintained by pumping. It is compact and can operate at a constant potential with unvarying reliability of results.

The new precision X-ray tube is so designed and constructed that it achieves extremely fine focusing of the high-speed, 2,000,000-volt electron beam. This made necessary not only a greatly improved electron source, but also a means of accelerating the electrons which would provide a constant rate of acceleration over the entire cathode-to-target distance. The tube was designed to include 180 sections, providing uniform accelerating steps of 12,000 volts each.

The new General Electric unit weighs 5,000 pounds, and can make satisfactory X-ray pictures through a foot of steel. It makes use of a sealed-off electrode tube in which the electrons, starting from the heated filament at the top, are speeded in 24 stages until they have the total rated energy. At a speed of about 179,000 miles a second they strike a copper-backed tungsten target at the end of the tube, and X-rays are generated. These may

either be squirted from the end, like water from a hose, or sprayed from the side. After penetrating the metal specimen, they fall on photographic film to make a picture. Construction of this tube was made possible by the use of fernico between sections of glass. Fernico is an alloy that expands like glass, so that the metal and glass can be fused directly together.

Under typical conditions it may take up to 4½ hours to make an exposure through an 8-inch steel casting with the older million-volt unit, while the new unit does it in 3½ minutes.

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## PSYCHOLOGY

## Pencil-and-Paper Tests Best for Picking Mechanics

► YOU CAN pick a radar technician, an airplane engine mechanic or a radio repairman better with a good paper-and-pencil examination than you can with the so-called "practical" tests of ability to take gadgets apart and put them together. This important finding of the Committee on Classification of Military Personnel appointed by the National Research Council at the request of the Army's Adjutant General is reported (*Science*, Sept. 29), by Dr. Walter V. Bingham, chairman of the committee.

As a result, 25 tests formerly given in Army Air Forces Basic Training Centers have been replaced by a battery of four tests, only two of which are performance tests. The proportion of failures in the courses has been substantially reduced.

A new test for night vision has been developed which meets the requirements of simplicity, practicality and reliability, Dr. Bingham revealed. He did not, however, tell what the test is like. One out of ten soldiers, he reported, are unable to recognize an enemy on a dark starlit night at a distance of only ten yards. The best one out of ten can recognize the enemy at 94 yards. The average man can see well enough to recognize a foe at 52 yards.

The Army is still searching for a good personality test. It would be very con-

venient to be able to give a man a test, the score of which would be useful to a special training unit, mental hygiene clinic, discharge board or court martial. So far, however, Dr. Bingham reports, the problem has been difficult and baffling.

The Army has given up the idea of selecting combat leaders by putting the candidates through a grilling "stress situation," even though such methods have apparently proved satisfactory to both the British and the Germans. It has seemed more feasible, Dr. Bingham said, to collect facts about how a candidate acts under the real stresses he meets in training—in the excitement of his first infiltration exercise with live ammunition or when he is being introduced to the poison gas chamber.

New task for the committee has been the development of tests and methods for giving vocational guidance to men who are about to leave the service. A school for training vocational counselors for this purpose has been established in connection with the Separation Center at Fort Dix, Dr. Bingham reported.

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**CHEMICAL DETECTOR**—A miniature gas-analysis set packed into a 2½-pound cotton duck carrier slung by a strap from the wearer's shoulder, will detect the presence of both persistent and non-persistent chemical agents. Gas sentinels equipped with these detection devices are able, by taking frequent tests, to spot the presence of even odorless blister gases.

*Signal Corps photograph.*



## PUBLIC HEALTH

# Isolate Strep Throats

This is the advice given by a Navy doctor. Patients with acute tonsillitis or pharyngitis harbor more infectious germs than those with scarlet fever.

► ISOLATION of patients with streptococcus sore throats for at least two weeks, just as scarlet fever patients are now isolated for three weeks, to prevent spread of their germs was called for by Comdr. Alvin F. Coburn, U. S. Navy Medical Corps, at the meeting of the American Public Health Association, held in New York.

Navy experience during 1943 with a dangerous spread of hemolytic streptococcus germs that gained increased virulence as they spread and apparently came close to wrecking plans for expansion of the Navy led to his emphatic recommendation for a new handling of streptococcus infection to protect the public health.

Patients with acute tonsillitis or pharyngitis harbor streptococcus germs that are more infectious than the strains that cause scarlet fever, he declared. Streptococcus infection of nose and throat without a rash are just as contagious as those with rash and probably more so.

Failure to take account of this and segregate persons who spread contagion facilitated the spread of hemolytic streptococcus infections throughout Naval Training Stations. In 1943 scarlet fever sickness rates exceeded all recorded rates in the U. S. Navy and there were not enough beds to meet the demand. Naval training was handicapped at large and important centers. By the end of 1943 a "dangerous cycle was under way." Several types of hemolytic streptococci had become highly communicable and acquired great virulence. They kept their ability to cause disease when transplanted by carriers to other geographic locations and even started streptococcus outbreaks at Naval activities in the south.

Faced with the possibility of an epidemic of streptococcus infections sweeping throughout all Naval training centers, the surgeon general of the Navy convoked a group of medical officers to meet this challenge. They made just one recommendation: to use sulfa drug prophylaxis. This appeared a heroic measure, but it saved the day.

By June 1944, 600,000 men had been given continuous sulfadiazine prophylaxis, with another 350,000 untreated to

serve as controls. As a result, streptococcus nose and throat diseases were reduced to 10% of the control level. Meningitis was reduced practically to zero. Well advanced streptococcus epidemics were ended and other outbreaks checked at their start. Rheumatic fever cases fell off. There was some decrease in pneumonia, but no benefit in preventing virus diseases.

The prophylaxis, Comdr. Coburn reported, was "at least 85% effective in preventing the implantation of widely disseminated, highly pathogenic strains of hemolytic streptococci in the throats of susceptible recruits and made possible the continuation and expansion of training programs at stations where other measures had failed to prevent the dissemination of hemolytic streptococci."

Sulfa drug prophylaxis to check streptococcus infections can be applied only to military populations. There is nothing as yet to indicate that it can be applied to civilian populations, Capt. Richard Hodges, of the Army, emphasized. He, too, reported the success of the method as used at an Army Air Force technical station. The prolonged course of prophylactic doses of sulfa drugs, he found, fortunately did not make the men less amenable to sulfa drug treatment when needed for pneumonia.

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## JOURNALISM

## Science Service Director Receives Journalism Medal

► WATSON Davis, director of Science Service, was one of the four recipients of bronze journalism medals presented by the School of Journalism, Syracuse University, at the school's tenth anniversary dinner, tendered by the New York Press Association on October 6. In presenting the medal to Mr. Davis, M. Lyle Spencer, Dean of the School of Journalism, pointed to Mr. Davis' "distinguished service in interpretation of science."

Three other persons received similar awards. They were Dr. George Gallup, director of the Institute of Public Opinion, Princeton, N. J., and originator of a system of public opinion statistics

known as the Gallup poll; Edward R. Murrow, chief of the London Bureau of the Columbia Broadcasting System, and dean of radio news reporters overseas; and Hanson Baldwin, military strategist and analyst for the New York Times.

The Syracuse Journalism medal has been awarded only once before, in 1936, to Frederic W. Goudy, noted type designer. Recipients are voted by the faculty of the School of Journalism, and medals are awarded only as the occasion arises.

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## MEDICINE

# Possible Cancer Weapon

Hope that impurities, possibly lecithin and lithium, in penicillin may be effective against this dread disease arises from laboratory tests.

► A CLUE to what may, and scientists hope will, become a weapon against cancer has been turned up in studies of penicillin. The latest of these studies are reported by Dr. Margaret Reed Lewis, of the Wistar Institute of Anatomy and Biology (*Science*, Oct. 6).

Penicillin itself, effective remedy for many germ-caused diseases, is not the anti-cancer weapon, but certain impurities that accidentally got into one lot of penicillin may be. Last March Dr. Ivor Cornman, now Corporal Cornman, found that a preparation of penicillin killed mouse and rat bone cancer cells growing in culture tubes outside the body. Non-cancerous cells were unharmed.

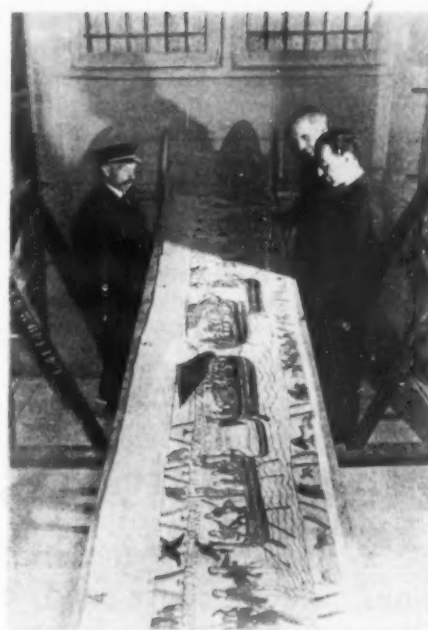
Subsequent tests by Mrs. Lewis, with whom Cpl. Cornman worked before induction into the Army, and by Dr. George O. Gey, of the Johns Hopkins Hospital and Medical School, showed that penicillin is not the anti-cancer weapon. Highly purified preparations of

penicillin, including those now being prepared for treatment of patients with germ diseases, have no damaging effect on either cancerous or noncancerous cells, these scientists found.

Tumor cells, however, were killed and normal cells unharmed, Mrs. Lewis now reports, when treated with certain dosages of a yellow sodium salt of penicillin. Apparently this preparation contains some substance that is lost in the highly purified penicillin preparations. Mrs. Lewis suspects that this substance, which may be the one that damaged the rat cancer cells, is either lecithin or lithium. She is starting tests now to check this point.

Lecithin is a compound found in egg yolk and nerve tissue as well as other animal tissues. Lithium is a white metal, the lightest of all metals. In the form of various salts, lithium has had some medical use.

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**BAYEUX TAPESTRY**—Protected by officials of the Louvre during German occupation, the famous cloth, which depicts the invasion of England by William of Normandy in 1066, is examined by an attache of the Louvre (left), Mr. Verrier, Inspector General of French Historical Monuments, and M. Jaujard, Director of the National Museums of France.

## PUBLIC HEALTH

# Typhus Likely Abroad

It is predicted that this coming winter will bring new outbreaks of this fever among foreign armies and civilians. We have effective weapons, however.

► THIS COMING winter will probably bring new outbreaks of typhus fever among both armies and civilians abroad, Dr. F. C. Bishopp, assistant chief of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, predicted at the meeting of the American Public Health Association in New York.

With our present defensive weapons against typhus fever, however, our own military forces are not likely to suffer seriously, nor does Dr. Bishopp see any valid reason for widespread outbreaks of the disease among civilians.

These weapons consist of typhus vaccine developed by the U. S. Public Health Service; DDT, discovered abroad but developed for military use by Dr. Bishopp's own bureau; and methyl bro-

made, another potent insecticide developed by Department of Agriculture scientists.

The last one has proved especially useful for delousing prisoners of war. It completely kills all lice and eggs in 45 minutes of treatment. A special fumigating bag or chamber is used for infected material.

Lice that carry deadly typhus fever germs are only one of the insects that threaten armies with disease. Others are the mosquitoes that carry malaria and filariasis; the mites which carry germs of scrub typhus or Japanese river fever, a disease found in the southwest Pacific and north into Japan; and flies which contaminate food with germs of typhoid fever and dysentery.

DDT is a powerful weapon against

both mosquitoes and flies. When available in sufficient quantities it will doubtless assist greatly in reducing food contamination from flies of all kinds, Dr. Bishopp stated. He pointed out that while our soldiers are protected by inoculation against typhoid fever, there is no such protection against dysentery and that blowflies are frequently abundant in areas previously held by the Japs. They emanate from the bodies of the enemy dead, from exposed enemy food supplies and from their unsanitary camps.

Soldiers who have seen for themselves how DDT aerosol bombs rout mosquitoes will demand these same bombs for ridding their homes of these pests after the war, Dr. Bishopp predicted. If methods of application and equipment can be perfected for using DDT in large scale operations against mosquito breeding places, it may play a part in eradicating malaria from the United States after the war, he declared.

Postwar use of DDT against lice to eradicate louse-borne typhus fever and relapsing fever throughout the world is seen by him as a "practical and highly desirable" program. (Turn to next page)

Flies which carry not only dysentery and typhoid but also cholera and other disease-causing parasites including worms, which are a serious pest in rural areas and on dairy farms, may be exterminated or nearly so by DDT in the postwar world. Bedbugs are another on the list for postwar routing by DDT.

Valuable timber stands may be saved by DDT from destructive forest insects such as the gypsy moth and the spruce budworm.

DDT, Dr. Bishopp warned, is not a

panacea for all insect ills, though it is effective against more insect species than any other synthetic organic insecticide. It is poisonous to man and animals when injected in considerable quantities or applied to large areas of the body in an oil solution. Its acute toxicity is less than that of many insecticides now used, but its persistence which makes it so effective must be considered from the standpoint of chronic poisoning. It is also highly poisonous to fish and many beneficial insects.

*Science News Letter, October 14, 1944*

#### PUBLIC HEALTH

## Heart Disease Increase

**Constitutes a serious threat to future generations, unless cause and a means of control can be discovered.**

► THE INCREASE of heart disease, particularly among younger persons, is "alarming" and constitutes a "serious threat to future generations" unless its cause and a means of control can be discovered, Lieut. Howard M. Odel, of the U. S. Naval Medical Center, Bethesda, Md., declared at the meeting of the Medical Society of the District of Columbia.

Disease of the heart's own arteries, known as coronary disease in medical terms, is the condition he discussed. The future of this disease, he said, depends on early recognition and "judicious management" of the patient.

In managing patients, he pointed out, doctors must steer between the danger of restricting their activities so far as to make chronic invalids of them and the equally great danger of too early return to normal activity, especially business.

The important thing, he said, is to allow enough time for other arteries to take over the damaged one's job of supplying sufficient blood to the heart muscle. This may take many months. The patient may be allowed out of bed for eight or nine hours a day and may do a little walking; but return to business may have to be delayed for months and maybe a year or more.

*Science News Letter, October 14, 1944*

### Malaria Carriers

► MILITARY demobilization will introduce a large number of malaria carriers into the country, Dr. L. L. Williams, Jr., of the U. S. Public Health

Service, declared at the same meeting.

He warned physicians and surgeons to be on the alert to recognize as a malaria relapse cases which might appear to be a post-operative infection or some other kind of germ disease.

Much may be done after the war to control malaria by spraying homes with a "long lasting insecticide" which he did not identify by name but which, from his description, may be DDT. This long-lasting insecticide, he said, is so successful in ridding homes of vermin as well as mosquitoes that its use is likely to become widely popular. This has been the experience with it in experimental trials.

Other measures of malaria control, such as eliminating mosquito breeding grounds, will also be necessary.

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#### MEDICINE

### Hope for Penicillin Cure Of Rheumatic Fever Fades

► HOPE THAT penicillin might prove effective as a remedy for the acute stage of rheumatic fever gets a severe setback from two reports. (*Journal, American Medical Association*, Sept. 30.)

From the U. S. Navy Research Unit at the Hospital of the Rockefeller Institute for Medical Research in New York, Lieut. Comdr. Robert F. Watson, Dr. Sidney Rothbard and Dr. Homer F. Swift report:

"Penicillin in doses ranging from 1,975,000 to 3,470,000 Oxford units given over a two-week period to eight young adults with acute rheumatic fever ap-

parently failed to alter the course of their disease."

Even more discouraging is the report of six Army officers working under the Army Air Forces Rheumatic Fever Control Program. They tried penicillin in 38 cases of rheumatic fever at Army Air Force installations and found that it not only failed to help the patients but in some cases made the course of the sickness worse.

The officers conducting this study were: Maj. Frank P. Foster, Maj. George E. McEachern, Capt. John H. Miller, Lieut. Col. Fred E. Ball, Lieut. Col. Charles S. Higley, and Maj. Harry A. Warren.

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#### MILITARY SCIENCE

### M-18 Tank Destroyer Had Part in Recent Drive

► THE SPEEDY M-18 tank destroyer helped make possible the fast movement of troops across France into Germany, the War Department revealed.

The 18.75-ton tank destroyer is both mobile and speedy, and it mounts a powerful 76-millimeter cannon to punish German tanks. Under fire, one of the units made up of M-18 TD's covered 65 miles in three and a half hours, and in another drive it traveled 165 miles in a day and a half, under blackout conditions part of the way.

The mechanical system of the TD permits the installation of a new engine in less than two hours. The 10 wheels operate independently, so that one broken wheel will not throw the vehicle out of action. It has dual controls that permit a change in drivers without switching seats. Its speed and smooth performance compares favorably to that of a command car.

Not long ago one of the tank destroyers was dispatched to blast a German pillbox near Brest. About 6,000 yards of water separated the TD from the pillbox. For 30 minutes the TD fired on the pillbox, changing its position frequently, and streaking away to protective cover between rounds, before the enemy could direct fire on it. The pillbox was put out of action.

The M-18 moves so rapidly that the enemy finds it almost impossible to strew new mines in its path.

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Limited quantities of *American penicillin* have been sent to the Swedish government for use by its health authorities.



## MILITARY SCIENCE

# Military Toys

Some of the Nazis' "secret weapons" have proved to be little more than expensive playthings. Cannot be considered war-winners.

► THE NAZI scientists delight in creating "secret weapons" which have proved to be little more than expensive military toys. Although some of these "toys" have cost many Allied lives and done much damage to civilian and military property, none of them can seriously be considered war-winners.

The "Goliath," a miniature tank, proved a fiasco in Italy and Normandy. This so-called secret weapon is a miniature of a standard tank, five feet nine inches long, of spotwelded light armor construction. Actually it is a remote-controlled mobile land-mine.

The tank is wheeled on a cart to an advance position near enemy objectives. Equipped from the special cart, it is manipulated by an operator with a control box, who crouches in a hideout and unreels 1,800 feet of cable through which he keeps contact with the tank. The German tank cannot move backward, or turn, and it is not radio-controlled.

It was designed to explode mine fields, blow up tanks, and demolish pillboxes. It has failed in all three objectives.

Allied aircraft experts are still puzzled by what the Luftwaffe's "asymmetrical plane, Bv 141" was supposed to accomplish. The single-engine plane is radical in design. The motor is mounted in a thin, cigar-shaped fuselage, slightly off center. A small cockpit, of about the same size as an engine mount on a twin-motored bomber, balances the fuselage in an off-center position. It looks like an Allied medium bomber with the fuselage pushed to the position of the left motor, and the cockpit placed where the right motor is located.

The radio-controlled glider bomb is one of the most famous of German war weapons. This is not to be confused with the even better known "robot" bomb used against England. The radio-controlled glider bomb resembles the standard German bomb, but has short-span wings and a tail. A specially constructed tail contains the radio receiving control apparatus. The propelling rocket is carried in a separate case slung underneath. It is usually carried beneath the fuselage of a conventional plane. When the target is reached, it is released

and from then until the time it explodes it is controlled by radio.

The designing of tricky bombs has been one of the Nazi scientists' favorite pastimes. Recently they developed a "butterfly bomb," with wings that open up as soon as the bomb is released, and act like a parachute to slow its descent. The new bomb is intended for use against troops on the march and in camp. The small but deadly charge explodes a few feet above the ground, showering bits of hot steel on any soldiers within range.

A real radio-controlled tank was first used by the Nazis against the Fifth Army at Anzio. The tank is 12 feet long, six feet wide, and four feet high. It is an explosives carrier rather than a tank, since it carries no armament. Dual controls enable a driver to take the weapon as close to the enemy objective as he dares.

After he leaves, the radio-control equipment is set in operation, guiding the tank to its objective. The machine drops an 800-pound explosive charge, reverses and returns to the driver, who remounts and drives it back to his own lines. Successful drivers of these tanks receive the Iron Cross, second class.

The armor is only three-quarters of an inch at its thickest point. The driver has to expose the upper part of his body to see, since there are neither vision slits nor periscope. The tank has a gasoline motor, and on a good road can move at speeds of about 28 miles an hour.

At least two German weapons have proved to be definite improvements over existing weapons, and very effective in combat. The Schmeisser Submachine Gun MP 40 is light and compact. It takes a nine-millimeter cartridge and can use pistol ammunition. Using the standard cartridge, the range and penetration of the cartridge are superior to that of a .45 caliber gun, but its shocking power is not as great. Soviet soldiers use this gun, captured from the Germans in large quantities, and they are reported to like it.

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**NAZI "BEETLE"**—United States Navy men take apart an Axis miniature tank loaded with explosives—to see what makes it tick. First used at Anzio, the robot vehicles are sent forward against Allied lines with a mechanism by which they can be exploded at a distance. Allied marksmen in most cases have picked off the "beetles" while they were still too distant to do any damage.

## PHYSICS

## Optical System Enlarges Television Pictures

► OPTICAL systems employing special types of mirrors and lenses are now used to pick up television images from the receiving tube in home sets and project them onto a screen suited in size to the requirements of the room in which the television performance is to be viewed.

The new system for the projection of television images was developed by Ioury G. Maloff and David W. Epstein of the research laboratories of the Radio Corporation of America. It consists of a spherical front mirror and an aspherical lens. The mirror looks like a shallow bowl, and the lens is flat on one side, with the opposite side having a special surface contour. The mirror arrangement resembles the one astronomers have used for many years to view the solar system.

The projection system is mounted near the floor of the receiver cabinet, and it projects the image straight up onto a flat mirror inclined at 45 degrees to the incoming beam of light. The mirror throws the image onto a translucent screen which is built into the front of the cabinet. This arrangement presents the advantages of compactness and a cabinet need not be larger than the present floor model radio console.

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## ELECTRONICS

## Electronic Devices Rushed As Result of the War

► AS A RESULT of the war, many new electronic devices have progressed from the idea stage to actual use in a remarkably short period of time, William C. White, head of the electronics section of the General Electric Research Laboratory, told the National Electronics Conference, held in Chicago.

Without the stimulus of war, he stated, years may elapse between the laboratory development of a good idea and its active commercial utilization.

Two of a number of reasons for this, he pointed out, are that "in place of the deadening mental attitude that accompanies depression, there is instead (in wartime) the atmosphere of energy and a determination to get results and get them quickly. In place of the normal feeling of resistance to change there is the certain knowledge that unless we get ahead of our enemies and keep ahead of our enemies we are licked. Thus, ne-

cessity for change and improvement becomes a very part of our existence."

Industrial electronics equipment, such as resistance welding control, has helped save millions of man and machine-hours and millions of pounds of critical materials since Pearl Harbor, Mr. White pointed out.

"Electronic devices in industry should not be of the nature of gadgets attached to some piece of equipment but rather must be engineered as a closely knit part of the whole," he declared.

"In most industrial applications, the electronic part of the apparatus comprises only a fraction of the cost of the whole. However, in such cases the electronic part of itself may not only be of limited use, but the rest of the equipment without its use is of little value," he stated.

Mr. White laid stress on the fact that the successful use of electronic devices in industry is based upon giving better results than other methods, or because the engineering problem cannot be solved in any other way.

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## ENGINEERING

## Globe-Flying Planes Meet All Kinds of Weather

► FLYING planes to the four corners of the globe necessitates the development of airplane equipment which will resist corrosion under a variety of humidity conditions, B. A. Rose, of Lockheed Aircraft Corp., Burbank, Calif., told the national aeronautic meeting of the Society of Automotive Engineers, in Los Angeles.

The plane and its parts must withstand practically all the extremes of weather from heat to cold and from tropical cloudbursts to the condensation which occurs when the plane changes altitude or encounters different climates, he reported.

"The little things can ground an airplane just as effectively as the big things," Mr. Rose commented.

The humidity has a direct damaging influence on the airplane and equipment by setting up corrosion which is destructive to electrical equipment, condensed moisture shorts magnetos and causes fire detectors to give false warnings. Ice formation damages electrical equipment.

The overall problems, he stated, can be reduced by providing surface coverings, proper lubrication, rust inhibitors, and by eliminating the possibility of direct water entry by installing moisture seals, traps, and suitable drains.

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# IN SCIENCE

## PHYSICS

## Cosmic Rays to Be Studied In Pamir Mountains

► A GROUP of scientists from the Lebedev Institute of Physics of the U. S. S. R. Academy of Sciences has left for the Pamir mountains to study cosmic rays at high altitudes. The expedition, under the direction of Prof. D. V. Smobelsyn, will continue studies that have been carried on for several years at the Atomic Nucleus Laboratory on Mount Elbrus, the highest mountain in the Caucasus. The Pamir mountains are located in southern Russia, where they reach into both Afghanistan and India.

Main objective of the expedition is to study the composition of cosmic radiations at high altitudes and determine the role played by heavy particles and secondary mesons first discovered in cosmic radiations in 1937.

In conducting its studies, the expedition will make use of a perfected proportional telescope and improved methods which the Atomic Nucleus laboratory has developed.

*Science News Letter, October 14, 1944*

## POPULATION

## War Has Varied Effects On Countries' Birth Rate

► "THE EFFECTS of the present war on birth rates have been much more varied than in World War I," Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company, told the American Public Health Association.

Russian and German birth rates have been most seriously affected and their military losses have been the heaviest of all belligerents, he reported. The French birth rate has fallen but not to the low level of the first World War. In the Netherlands and Denmark, the birth rates have actually increased above prewar levels. The birth rate in the United States has increased to the highest level in 20 years, but a sharp reduction in 1945 is expected because so many young men are overseas and likely to remain there for some time. England also has experienced a war boom in births, with this year expected to put the rate at its highest figure for 15 years.

*Science News Letter, October 14, 1944*



# THE FIELDS

## PUBLIC HEALTH

### Polio Cases Still Decline But Meningitis Increases

► **INFANTILE** paralysis cases continued to decline for the fourth consecutive week. For the nation as a whole 976 cases were reported by state health officers to the U. S. Public Health Service in Washington for the week ending Sept. 30 as compared with 1,159 cases for the preceding week. This brings the total reported since the beginning of the year up to the end of September to 14,548.

Meningitis cases, already high in number, are expected to show a decided increase from now on. So far this year 13,856 cases have been reported. Although about 800 below the report for the same time last year, this is almost eight or nine times as high as would normally be expected on the basis of reports for the past five years.

*Science News Letter, October 14, 1944*

## SAFETY

### Record Low in Accidents On War-Construction Jobs

► **CONSTRUCTION** jobs during the war period have taken a lower accident toll than ever before, despite rapid labor turnover and many "rush" projects, Lloyd A. Blanchard, chief, safety and accident prevention branch of the U. S. Army Corps of Engineers, told the National Safety Council meeting in Chicago.

A large number of accidents had been feared. Organization of new combinations purely for war construction, the necessary thin spreading of the relatively few outstanding key construction men, intensely competitive labor market, draining of the physically fit personnel by the armed forces, and the utilization of thousands of contractors who knew little about accident prevention, seemed to set the stage for trouble.

"The actual results were completely contrary to the forecasts," Mr. Blanchard stated. "For 1941 with an exposure of 866,000,000 man-hours, the frequency rate was 26.83 and the severity 2.18; 1942 had an exposure of 1,799,000,000 and a frequency rate of 17.61 and a severity of 2.49, and in 1943 the exposure totaled 727,000,000 man-hours and the frequency

rate was 14.61 and the severity 2.89."

Outstanding among the safety activities utilized, he reported, was establishing accident prevention as a contractual obligation; enforcement of specific published construction safety requirements; establishment of mobile first aid field stations, infirmaries and hospitals staffed with adequate professional personnel; and supervision of all work by Government professional safety engineers.

Looking toward a future of even fewer accidents, Mr. Blanchard stated that the accident prevention program which brought such outstanding results during the war can and should be applied to construction work in the postwar era with equally good results.

*Science News Letter, October 14, 1944*

## ORDNANCE

### Shots from Tanks Accurate With New Type Stabilizer

► **YOUR POSTWAR** car may ride smoother and your train trip be more comfortable when a new gyro-stabilizer that today enables American tanks to shoot accurately on the run becomes available for peacetime application.

Shooting while the tank is racing across rough battlefields is made possible by the gyro-stabilizer unit that reduces the amount of jouncing transmitted from the tank to the gun. The new device was invented by Clinton R. Hanna, of the Westinghouse Research Laboratories in Pittsburgh.

The electrically-operated gyro-stabilizer controls the unit that, in effect, floats the gun on its trunnions, keeping the barrel at a fixed elevation and the target within focus of the gunner's telescope sight regardless of the lurching of the tank. A piston in a cylinder attached to the breech of the tank's gun moves up and down by hydraulic action to stabilize the movement of the gun. The gyro itself is attached to the breech of the gun. Every time the tank rolls over a rock, or pitches into a shell hole, the gyro asserts itself and, by a newly developed device that varies the voltage transmitted to the electric valves hydraulically controlling the piston, causes the piston to move up or down, thus correcting the position of the gun.

The gyro-stabilizer makes possible better than 70% hits over a target range of from 300 to 1200 yards. Without the stabilizer, experienced gunners are unable to score 1% shots under similar conditions.

*Science News Letter, October 14, 1944*

## METALLURGY

### Magnesium Will Be Used In Household Appliances

► **WIDESPREAD** use of magnesium, the lightweight metal, in postwar commercial and consumer products was predicted by R. P. Lansing, vice president of Bendix Aviation Corporation, at the first annual meeting of the Magnesium Association in New York.

He pointed out that the major problems of fabricating magnesium have been solved by wartime research, so that the metal can be used in such applications as knitting machines, bread-slicing machines, household appliances, portable hand tools, radios, cameras and other items.

Today, magnesium is extracted from sea water and inland magnesium ore for use in castings, airplane parts, and other war materials.

Urging that a postwar program be undertaken on magnesium, Mr. Lansing stated that it should be based on two fundamentals.

"One, providing economic justification for the use of magnesium in competition with other metals—and perhaps some plastics. Two, expanding research into new uses for magnesium."

*Science News Letter, October 14, 1944*

## CHEMISTRY

### Heat Resistant Plastic From Chemical Compound

► **BOTH A HEAT-resistant** plastic and a synthetic rubber can now be made from a new chemical compound developed by the Mathieson Alkali Works. The new plastic is expected to be of particular importance in electronics and, in general, wherever electrical insulation at high temperatures is required. The rubber is under test in heavy duty tires on motor vehicles.

The new compound from which both materials are made is known as dichlorostyrene. The rubber is made from it and butadiene.

Dichlorostyrene is a chlorinated product. Its monomers are highly active and polymerize readily. The polydichlorostyrene, the plastic, resembles polystyrene in chemical resistance, solubility and general appearance. It differs chiefly by its resistance to heat, and it is more resistant to water. It is stable and shows no tendency to lose hydrochloric acid. It may be molded by conventional methods.

*Science News Letter, October 14, 1944*

MEDICINE-PHOTOGRAPHY

# Photographs Aid Doctors

The sick and wounded may get well sooner because of photos taken by MAMAS. After the war, this organization will contribute to better understanding of disease.

By JANE STAFFORD

See Front Cover

► DOCTORS behind all our far-flung battle lines have a new organization to help them treat the sick and wounded. When peace comes, this same organization, the MAMAS, will play an important part in making permanent the advancement in medical science which has been called "the only worthwhile result of any war."

MAMAS is not a maternal organization. The name is made from the initial letters of the Museum and Medical Arts Service. It was organized as part of the Army Medical Museum in 1942. Its purpose, as stated by Capt. Ralph P. Creer who heads it, is "to provide an adequate and efficient illustration service for the Medical Corps." Men of MAMAS, like those shown on the front cover of this SCIENCE NEWS LETTER, are "shooting" for the records so that Army doctors and aid men will have vivid, accurate pictures to prepare them for the battle injuries they will handle.

To the layman, an illustration service, however adequate and efficient, might seem the last thing the Medical Corps would need or want. But suppose you were a young doctor, trained to recognize measles and mumps, tuberculosis, cancer, syphilis and to handle the wounds of peacetime traffic accidents, and found yourself confronted with the skin sores of some strange tropical disease, or the frightful injuries of shell-torn arms and legs.

There would be no medical library, no older and more experienced physician to consult. You are on your own, responsible for restoring these sick and wounded men to health and fighting efficiency if possible. You may know the names of the tropical diseases and the rules for treating them. But how can you be sure which one has attacked this soldier?

If you have, in your training for medical work in the Army, seen vivid, accurate drawings and photographs of people sick with unusual tropical diseases

or of the unusual injuries that occur in this war, you are better prepared to recognize the condition in the patient before you.

This is where MAMAS helps. Its specially trained artists and photographers are ready to go anywhere in the world where a medical officer calls them to get pictures of an unusual disease or injury. They are stationed at key points so as to be quickly available.

Their pictures are flown back to the Army Medical Museum in Washington so that in a short time medical students and physicians at home, preparing for service with the armed forces, can study the pictures and go out better equipped to treat the wounded and sick of our fighting forces.

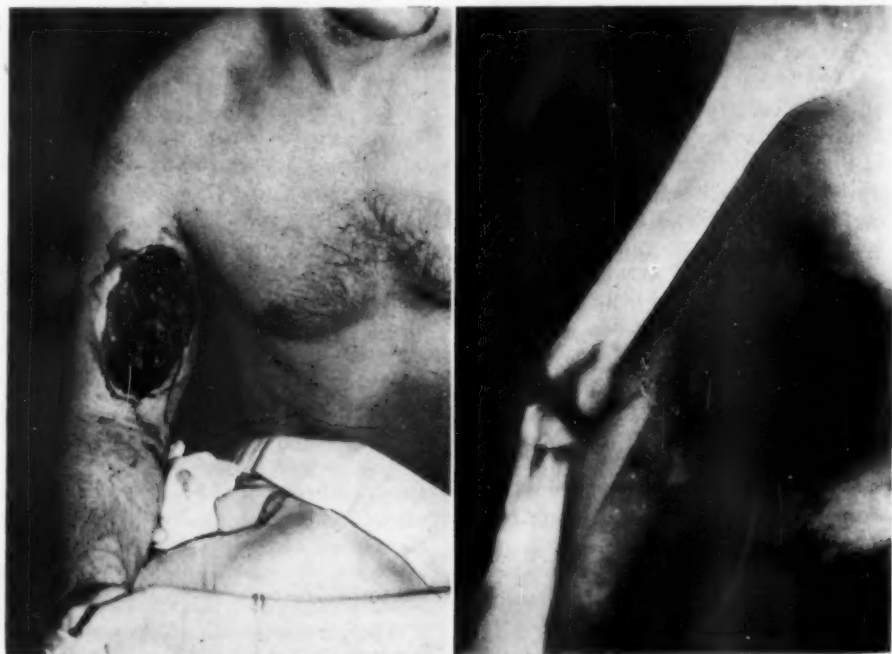
After the war, this rogues' gallery of disease can serve medical scientists seeking better understanding and perhaps even better methods of treating disease

and injury than those that we now have.

MAMAS is doing more than making a picture history of the medical phases of the war. It is also collecting missiles and helmets that have been struck or hit by gunfire; medical and surgical instruments of our own and of the enemy, especially those modified or improved during the war; and specimens of injured and diseased tissues, preserved and fixed for study at any time in the future.

Doctors are not the only ones whose training will be helped by MAMAS. From its accurate, vivid pictures, the training division of the Surgeon General's Office can make realistic, full-size wax models of various war injuries to show the enlisted men of the Medical Corps, those heroic aid men who are the first to reach and treat the wounded and who give much nursing care in Army hospitals. In addition, Capt. Creer states, duplicate casts of latex or similar material, thin sleeve-like appliances, can be made. Worn on maneuvers, they give a realistic sight of the injuries that may be encountered in battle.

Science News Letter, October 14, 1944



**GUNSHOT WOUND**—Among the least gruesome of the Army Medical Museum's rogues' gallery of disease and injury are these pictures of a gunshot wound of the arm. The X-ray picture (right), shows the path torn by the missile, the splintered bone and its fragments scattered through the flesh.



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## Do You Know?

Water beetles carry a reserve supply of air under their wing covers.

Coffee-producing Brazil raises more meat than coffee, on a valuation basis.

Agriculture in Siberia is highly mechanized, tractors furnishing 70% of its draft power.

South America, long an importer of rice, is now growing more than can be eaten there.

Alaska's Bristol Bay region is the world's chief production center for red salmon.

The most valuable forest product of Honduras, Central America, is mahogany.

Fishing companies like swordfish because little labor is required for processing, in comparison with that needed for the more common smaller fish.

The American pronghorn antelope, *Antilocapra americana*, is the only hollow-horned animal which annually sheds its horns.

Meteorites, stone and iron masses that fall from the skies, are the only objects that man can touch and handle that have not originated on the earth.

Malaria mosquitoes have a flying range of only one mile at most from their breeding places; other varieties have a flying range of five miles or more.

A new insecticide, composed of chili pepper, sabadilla, arsenic, and quicklime, now being produced in Peru at an annual rate of a million pounds, is particularly suitable to protect growing cotton from worms and aphids.

The "Big Inch" pipe line, stretching 1,363 miles from Longview, Texas, to the New York-Philadelphia area, delivered nearly 93,300,000 barrels of crude oil from Texas fields to eastern refineries in its first year of operation.

With bamboo now being grown in the southern states and in Middle America, bamboo sprouts will be available but will probably not become as important an item in the American diet as they are in the Chinese or Japanese.



### Ready for Spring

► NEXT SPRING'S Easter bonnets and dainty gowns are already being made, and shortly after Christmas they will be moving onto the merchants' shelves. But even the fabricators of fashions are not more forehanded than the herbs and shrubs and trees of the woodlands. Practically every flower and leaf that will gladden our eyes next April and May is already in place, and only awaits the signal that will be given by the returning sun and the warm spring rains.

Preparation for next spring's flowers, as a matter of fact, began immediately after last spring's flowers had faded, and in most plants went on even while fruits and seeds were ripening. The leaves of plants like dog-tooth violet and trillium, that stood all summer long with no flowers to grace them, were busy all the time making food and sending it down into underground bulbs, corms and rhizomes. In the meantime, buried growth-points were forming up into the beginnings of buds, enfolding the embryonic structures of another crop of flowers. When the new growing season comes on, the food reserves will be liquidated and poured into the task of speeding the growth and unfolding of the new flowers.

Something of the same sort goes on, all over the branches of woody plants that blossom early in spring, like dogwood and redbud, and the lilacs and forsythias of our gardens. In the axils of this year's leaves, or at the twigtips, the buds of next year's growth form during the summer. Already in them are the beginnings of next spring's bloom.

Only by provisions like this can we have spring flowers at all. Flowers are expensive things: they need a great deal of food for their structure, and more for

the energy expended in the rapid process of blossoming. Most plants have to make their own food, which is the job of mature leaves. If flowers come before the leaves, or while the leaves are young and small, the food will have to be stored ahead of time—usually during the preceding summer and early autumn.

The whole process of forcing flowers, so that we have a foretaste of spring even in winter, is based on this fact. We bring bulbs or cut branches indoors, giving them as nearly spring-like conditions of temperature, moisture and light as we can provide. These stimuli cause the unlocking of the natural food cupboards, and release the chain of events that ends in the early unfolding of the flowers.

*Science News Letter, October 14, 1944*

### ORDNANCE

## Flame Throwing Tank Hurls Blazing Oil in Chunks

► LIKE an armored blowtorch, the Army's new flame throwing tank, details of which have been revealed for the first time by the War Department, can crash through heavy vegetation in the teeth of enemy fire, directing its cone of fire at enemy infantry who cannot be effectively reached otherwise by foot-soldiers or tanks.

The flame throwing tank consists of a standard M1A1 portable flame thrower mounted on either side of a light or medium tank. Details of how the apparatus is mounted are not given for security reasons. However, it is stated that the flame throwers do not interfere with the other armament of the tank.

A new flame gun, developed by the Chemical Warfare Service, was also revealed. Known as the M2-2, it can shoot liquid fire a greater distance than the earlier M1A1 model, which has a range of 60 yards.

The apparatus fires jellied oil, a thickened fuel made of blazing oil chunks which spatter and cling to the target. The M2-2 can also fire a combination of gasoline and diesel oil.

A third item, the Smoke Drake, was also announced. It consists of the largest smoke-making machine in the world, the M1 generator, mounted on the amphibious "duck." One of these machines can blot out a square mile in 10 minutes with a dense white smoke screen. The fact that the smoke generator can operate from land or water makes the smoke screen more effective, since the smoke machine can move anywhere, as wind directions shift, to blanket targets.

*Science News Letter, October 14, 1944*

# THE SLEEPING GIANT

*America's motorcar industry has been at war. When it gets back to making automobiles, a vast new opportunity for engine improvements will be waiting in the improved gasoline that will then be available.*



HIGH ON THE LIST of things the average man wants after the war is a new automobile. But John Public looks forward to something more than just a new car—he wants a better car.

It is true that replacements for essential transportation may keep the automobile industry more than busy for quite awhile after the war. During this period revised versions of 1942 models may be all that are available. Once this phase of reconversion is over, there will be the problem of continuously rebuilding and replacing America's

automobile population—and again the problems of “creating” sales and customers in a competitive market. We can look forward to future engineering competition along the lines of the simple, time-honored, American method of making better and better cars.

Refinements in body design, new accessories and greater riding comfort will play their part. But the

most significant progress in motorcar design will depend—in the future, as in the past—upon the development of engines that get more work from each gallon of gasoline.

The basis for such progress already exists: It lies in the development of engines to fully utilize the greatly improved gasoline which the petroleum industry will be in a position to offer the public.

## ETHYL CORPORATION

Chrysler Building, New York City

*Manufacturer of Ethyl fluid, used by oil companies to improve the antiknock quality of aviation and motor gasoline.*



Wartime progress by America's petroleum industry has paved the way for fundamental progress in post-war automobile engine design.

## PUBLIC HEALTH

# Army Alert for Influenza

The first sign of an outbreak will be the signal for vaccination of threatened units with the new vaccine, now prepared in large quantities.

► "INFLUENZA watches" have been established in Army units overseas and at home to detect the first signs of any outbreak that may threaten our troops, Maj. Aims C. McGuinness of the Office of the Surgeon General, U. S. Army, announced at the meeting of the American Public Health Association, held in New York.

If the flu watches do find the disease breaking out, their report will be the signal for vaccination of threatened units with the new anti-influenza vaccine now being prepared in large quantities for Army use.

With this vaccine, sulfadiazine prophylaxis for meningitis, oiling of floors and blankets to trap germs and other measures, the Army expects to be able this coming winter to control to a greater extent than ever before those diseases whose germs are spread through the air.

Glycol vapor sterilization of the air to check germ spread is being studied by the Army Epidemic Control Commission at the Lockheed airplane plant in Los Angeles, Maj. McGuinness stated.

The invisible, odorless, harmless glycol vapor is being loosed in one large room containing 1,000 workers, while another of the same size is being left unvaporized as a control.

The fact that the workroom in this plant is air conditioned makes it easy to control temperature and humidity. This is necessary for most efficient germ killing by the glycol vapor, Maj. McGuinness explained.

Although this method of air sterilization to check disease spread has shown great promise, the Army group, Maj. McGuinness said, does not think the method will be practical for Army barracks in this war because of technical difficulties. Manufacture of vaporizing machines and their maintenance and maintaining proper humidity and temperature are among the present practical difficulties. The Army group does feel the method has a real place in permanent buildings such as hospitals.

*Science News Letter, October 14, 1944*

## Cancer Fight Intensified

► THE FIGHT against cancer will be greatly intensified in the near future, it appears from action and discussion at the meeting.

First, a new national association to further control of cancer, the Public Health Cancer Association of America, was organized. Its purposes are "to encourage the adoption and expansion of cancer control programs by city, county and state health departments, to facilitate the interchange of views regarding effective methods of cancer control and to promote cooperative research in the epidemiology of cancer and the application of control measures to human cancer."

Second, at the first meeting of the new society, a strongly worded plea for federal funds for cancer research was made by Dr. E. V. Cowdry, director of research at the Barnard Free Skin and Cancer Hospital, St. Louis.

The funds, he suggested, should be made in the form of "incentive payments" and with a "minimum of red tape." As recipients, he suggested mem-

bers of the Association of American Universities, acceptable medical schools, approved hospitals and such other organizations as may be recognized by the National Research Council as meriting this kind of assistance.

Organizers of the new Public Health Cancer Association are representatives of the departments of health of the following 11 states: Massachusetts, New York, Illinois, Georgia, Alabama, Connecticut, Vermont, Iowa, Missouri, West Virginia and Michigan. Members of the staff of the National Cancer Institute and of the American Cancer Society are understood also to have played a part in organizing the new association. Its officers are: President, Dr. Herbert L. Lombard of the Massachusetts Department of Health; vice-president, Dr. Raymond V. Brokaw, of the Illinois State Department of Health; secretary-treasurer, Dr. Morton L. Levin, of the New York State Department of Health.

*Science News Letter, October 14, 1944*

## ZOOLOGY

## First Hybrid Gibbon Born at Washington Zoo

► A HYBRID gibbon baby whose mother is a Siamese gibbon and whose father is a Sumatran gibbon was born on October 3 at the National Zoological Park, Dr. William Mann, director of the zoo announced.

As far as Dr. Mann can determine it is the first hybrid gibbon ever born. It is a cute but ugly little creature with long, thin arms and legs.

There are very few births of gibbons in zoos. The only other birth of a gibbon at the National Zoological Park was 13 years ago. But that was an ordinary gibbon, not a hybrid.

*Science News Letter, October 14, 1944*

## INVENTION

## Toast, Bacon and Eggs Cooked at Same Time

► A COMBINED toaster and cooker has been awarded patent 2,358,996, issued to Daniel Platkin of Los Angeles. Electricity is used for heating, and both toasting and cooking may be done at the same time.

The toasting part consists of two sloping surfaces with the heating element between them as in the ordinary electric toaster. In the base of the equipment is a sliding tray with heating elements under it, for cooking bacon, eggs and chops.

*Science News Letter, October 14, 1944*

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# Books of the Week

► **ENTHUSIASTS** for tropical fishes and similar amiable hobbies will find much useful information in Edward T. Boardman's **GUIDE TO HIGHER AQUARIUM ANIMALS**. It describes many interesting native reptiles and batrachians as well as the more familiar fishes, and it has many good illustrations. (*Cranbrook Inst.*, \$2.)

*Science News Letter, October 14, 1944*

► **AIR NAVIGATION** is discussed according to the standards required by the International Committee of Air Navigation in **HANDBOOK OF AIR NAVIGATION** by W. J. Vanderkloot (*McGraw*, \$3.50). The book is valuable as a refresher for the trained navigator. Novices may find this book beyond their grasp, but will have a valuable reference manual.

*Science News Letter, October 14, 1944*

► **PHYSIOLOGICAL** processes are increasingly interpreted in terms of enzyme action. Physiologists and biochemists who appreciate this fact can be expected to give a good welcome to **ADVANCES IN ENZYMOLOGY**, edited by F. F. Nord and C. H. Werkman (*Interscience*, \$5.50). The book is just what its title professes it to be: not a complete text, but rather a discussion of some of the newer things in its particular discipline.

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## Just Off the Press

**ADVANCES IN PROTEIN CHEMISTRY**—M. L. Anson and John T. Edsall—*Academic Press*, 341 p., illus., vol. I, \$5.50. Vol. II in preparation.

**CONTROL OF DESTRUCTIVE MICE**—F. E. Garlough—*Govt. Printing Office*, 37 p., free. Conservation Bulletin No. 36, U. S. Dept. of the Interior, Fish and Wildlife Service.

**DANA'S SYSTEM OF MINERALOGY**—Charles Palache and others—*Wiley*, 834 p., illus., Vol. I, \$10.

**ENOUGH AND TO SPARE: Mother Earth Can Nourish Every Man in Freedom**—Kirtley F. Mather—*Harper*, 186 p., illus., \$2.

**A FIELD COLLECTOR'S MANUAL IN NATURAL HISTORY**—Prepared by Members of the Staff of the Smithsonian Institution—*Smithsonian Inst.*, 118 p., illus., paper, 50 cents.

**HIGHWAY RESEARCH BOARD—Proceedings of the Twenty-third Annual Meeting**—Roy W. Crum and Fred Burggraf—*Govt. Printing Office*, 606 p., illus., \$3.50.

**HISTORY OF COLOR PHOTOGRAPHY**—Joseph S. Friedman—*Am. Photographic Pub.*, 514 p., illus., \$10.

**LATIN AMERICAN YEAR: A Pictorial Calendar for 1945**—Kurt Severin—*Duell*, illus., paper, \$2. Eagle Books.

**MATERIALS MANAGEMENT: A Problem of the Airframe Industry**—Howard T. Lewis and Charles A. Livesey—*Harvard Univ.*, 48 p., paper, \$1.50.

**MEET THE ELECTRON**—David Grimes—*Pittman*, 120 p., illus., \$2.

**A PSYCHOLOGIST LOOKS AT LOVE**—Theodor Reik—*Farrar*, 300 p., \$3.

**SAMPLING INSPECTION TABLES: Single and Double Sampling**—Harold F. Dodge and Harry G. Romig—*Wiley*, 106 p., illus., \$1.50.

**THE SOILS OF EQUATORIAL REGIONS WITH SPECIAL REFERENCE TO THE NETHERLANDS EAST INDIES**—E. C. Jul. Mohr—*Edwards Bros., Inc.*, 766 p., illus., \$7.50. Trans. from the *Nederlandsch* by Robert L. Pendleton.

**THE TECHNIQUE OF THE TERRAIN: Maps and Their Use in the Field in Peace and War**—H. A. Musham—*Reinhold*, 228 p., illus., \$3.85.

**TO THE SOUTH**—Kurt Severin and Lenore Sorsby—*Duell*, 244 p., illus., \$3. Eagle Books.

**VITAMINS AND HORMONES: Advances in Research and Applications**—Robert S. Harris and Kenneth V. Thimann—*Academic Press*, 514 p., illus., Vol. 2, \$6.80.

**WARSHIPS OF THE WORLD**—Roger Kafka and Roy L. Pepperburg, eds.—*Cornell Maritime*, 1038 p., illus., \$15.

*Science News Letter, October 14, 1944*

### AERONAUTICS

## Double-Deck Cargo Plane Designed for Postwar Use

► A NEW double-deck, four-engined cargo plane for postwar commercial use is being built along the same general design as the B-29 Superfortress.

Built by Boeing Aircraft Company, Seattle, the principal difference between the cargo version of the B-29 and the present bomber itself will be a larger

fuselage. This will make it possible for the new plane to carry greater amounts of cargo and more passengers. General weight and performance of the new plane are expected to be about the same as the Superfortress.

The double-deck interior arrangement will bring to aircraft a feature long popular in motor buses in large cities. Passengers will be carried on two levels, with satircases connecting. Under certain circumstances, cargo may be carried on the lower deck instead of passengers.

While the new Boeing plane will be larger than the largest transport now flying, the Lockheed Constellation, it will be smaller than the commercial cargo and passenger plane now under way at the Consolidated Vultee plant at Fort Worth, Texas.

No aircraft plants other than those mentioned have announced plans for a super-cargo plane for land flying exclusively. Largest sea-going aircraft is the Martin Mars, several of which are now in use by the Navy, connecting West Coast ports with points in the Pacific. Douglas Aircraft is expected to announce its contribution to the big plane field upon the completion of research it is now conducting to determine from users of aircraft in peacetime just what features they will want in the planes they will use.

And so, the B-29 without any sting will be offered as a super-cargo plane after the war.

*Science News Letter, October 14, 1944*



## Like Mineral Study?

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# • New Machines and Gadgets •

✿ **PORTABLE** gas generating plant, to make hydrogen for barrage balloons and carbon dioxide for fire protection, is mounted on a 16-ton Army trailer for use in combat areas. The unit contains oil heaters, high temperature catalytic conversion chamber in which the gases are formed from water and alcohol, cooling system and high-pressure compressor.

Science News Letter, October 14, 1944

✿ **TURNTABLE**, with four lead-lined vertical chambers, is used to hasten the X-ray inspection of manufactured metal objects to detect interior flaws and defects. One chamber at a time faces the exposure station, and one the film placing station while the others are being reloaded. The lead protects workers from dangerous radiation.

Science News Letter, October 14, 1944

✿ **FOLDING BED** which when closed resembles a chest of drawers has a lower drawer section for storage which acts as a center support for the bed when opened. The upper part is in two hinged sections that open outward to a horizontal position forming the bed.

Science News Letter, October 14, 1944

✿ **FACE-FITTING** factory goggles to protect the eyes of workers are now made of a light tough plastic molded to fit closely around the face, as shown in the



picture. Lenses are easily changed when necessary. These ventilated goggles are roomy enough to wear over ordinary glasses.

Science News Letter, October 14, 1944

✿ **BOWLEGGED** hair fastener is a four-pronged ringlet hairpin with two long inner and two short outer prongs. The longer prongs are curved outward with their points together to hold a full tuft of hair. The device is used to set a curl or ringlet.

Science News Letter, October 14, 1944

✿ **TOBACCO-SAVING** cigaret holder, which permits every particle of the weed to be smoked, is an interlocking tube with small openings in each of its ends. The cigaret is placed in the center and smoked from either extended end. No ashes can drop on the rug.

Science News Letter, October 14, 1944

✿ **AN IMPROVED HONE**, made from natural crystalline quartz, and finished by a new process, sharpens tools quickly with little effort. The honing surface, after being cut from the crystal and shaped, is immersed in hydrofluoric acid for ten hours, then removed with its face evenly etched.

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